

A BREEDING POPULATION OF THE YELLOW-BELLIED SEA SNAKE, *PELAMIS PLATURUS*, IN THE GULF OF CARPENTARIA

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A surface aggregation of *Pelamis platurus* was observed on 13 July 1992, along a 99.4km line between 14.59°S, 140.73°E and 15.34°S, 140.25°E within the Gulf of Carpentaria. Recently born, immature and adult sized snakes provide the first evidence of a resident breeding population in northern Australian waters. □ *Sea snake, Gulf of Carpentaria, breeding, Pelamis.*

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The Yellow-bellied Sea Snake, *Pelamis platurus*, is widely distributed in Australia as beach-washed specimens but is poorly documented in its marine habitat (Cogger, 1975; Guinea, 1992). Shuntov (1972) implied that *P. platurus* in northern Australian waters were transported from the Coral Sea, whereas Guinea (1992) suggested they could be 'part of a geographically discrete, yet seldom encountered, breeding population'.

METHODS

Observations of sea snakes were made from the bow of the *One and All*, a twin masted, square rigged, 42.7m brigantine under sail en route from Weipa to the Wellesley Group. A bow watch during daylight hours recorded marine reptiles, mammals and birds. With each sighting, a latitude, longitude and water depth (corrected for depth of sensor below the waterline) were recorded from the ship's navigational instruments. No animals were captured. Surface water was sampled by casting a bucket over the side and hauling it in quickly, for an immediate recording of water temperature using a quick reading, mercury in glass thermometer ($\pm 0.1^{\circ}\text{C}$). All species identifications were made by the author while crew members assisted in locating wildlife. The uniquely conspicuous colouration of *P. platurus* (Heatwole, 1975a) contributed to the ease of identification.

RESULTS

A total of 112 sea snakes were seen in the 6 days. Of these 84 (75.0%) were *P. platurus*. All *P. platurus* were observed on 13 July 1992, along a 99.4km line between 14.59°S, 140.73°E and 15.34°S, 140.25°E (Table 1). All sightings occurred between 0936-1730hr. TL estimates for

32 *P. platurus* that passed close to the bow ranged from 25-60cm with 88% <45cm. At locations where *P. platurus* was recorded, mean water depth was 47.6m (SD=1.04, range=43-49m, n=35) and mean surface water temperature was 24.7°C (SD=0.05, range=24.7-24.8°C, n=6). Most *P. platurus* did not dive on close approach of the ship.

Other species of sea snakes were more difficult to identify, often because they dived on the ship's approach. Of the 28 non-*Pelamis* sea snakes observed (Table 1), only 3 *Lapemis hardwickii*, including a copulating pair, 6 *Hydrophis elegans* and 1 *Disteira kingii* were identified.

On the transect with *P. platurus* were post hatchling marine turtles *Chelonia mydas* and *Natator depressus* with carapace length ~15cm. While it is well documented that *P. platurus* and post hatchling marine turtles aggregate along drift lines where currents converge (Kropach, 1975; Carr, 1987), there were no signs (floating debris) in this case, of a convergence zone.

DISCUSSION

P. platurus is the most widely distributed sea snake species globally, with records extending from Possiet Bay in southern Siberia to New Zealand and Tasmania and from the Cape of Good Hope to Panama (Minton, 1975). However, the species rarely inhabits waters <20°C and its upper lethal temperature for indefinite survival is ~33°C (Dunson & Ehlert, 1971); while it is tolerant of low salinities, it does not occur in coastal waters subject to high variability in salinity (Dunson & Ehlert 1971). Cogger (1975) postulated a permanent breeding population off central NSW coast where surface waters reach 17°C in winter. However, Hecht et al. (1974) identified the 26°C isotherm as delimiting the

TABLE 1. Description of transects over which searches for sea snakes were conducted from the tall ship *One and All* in the Gulf of Carpentaria during 12-22 July 1992.

Date	Start				Finish				Transect length	Sea snakes sighted	
	time	latitude	longitude	depth	time	latitude	longitude	depth		<i>P. platurus</i>	other species
12 July	1105hr	12.67°S	141.77°E	12.3m	1759hr	13.15°S	141.62°E	-	64km	0	4
13 July	0715hr	14.40°S	140.87°E	48m	1800hr	15.40°S	140.23°E	43m	130km	84	16
14 July	0930hr	16.62°S	139.83°E	23m	1100hr	16.50°S	139.84°E	23m	15km	0	0
17 July	1440hr	16.08°S	139.20°E	27m	1855hr	15.56°S	139.13°E	48m	63km	0	3
18 July	0730hr	14.43°S	138.33°E	58m	1850hr	13.62°S	136.93°E	28m	177km	0	5
22 July	1031hr	12.07°S	136.77°E	20m	1200hr	11.87°S	136.75°E	35m	22km	0	0

distribution of permanent breeding colonies. *P. platurus* is a pelagic sea snake that aggregates in association with slicks and drift lines (Dunson, 1975). Aggregations are not seasonal although calm weather favours their formation (Kropach, 1975). *P. platurus* is piscivorous, in the top 2m rather than at the bottom like most sea snakes (Kropach, 1975); has been recorded diving to c. 20m (Kropach, 1975) and can adjust buoyancy to suit activities (Graham et al. 1975); cannot regain the sea if beach-washed (Dunson, 1975).

In the Gulf of Panama *P. platurus* has: TL at birth = 22-26cm; ♂♂ sexually mature at TL ~50cm; ♀♀ sexually mature at TL ~64cm; non-seasonal breeding (Kropach, 1975). By analogy, the eastern Gulf of Carpentaria population encompassed all size ranges from recently born to adult, with the majority being immature, thus demonstrating a breeding population, the first recorded for northern Australia.

Although sea snakes have been well studied in the Gulf of Carpentaria *P. platurus* has rarely been reported (Guinea, 1992; Shuntov, 1972; Heatwole, 1975b; Wassenberg et al., 1994).

The Gulf of Carpentaria is in a region that Hecht et al. (1974) predicted should support a permanent breeding colony, although its water was slightly cooler than identified as limiting permanent breeding populations. The extent and habits of this population are yet to be determined.

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